

III. REMARKS

A. Status of the Claims

Claims 1-7 and 10-21 were pending in this application, and all claims have been rejected.

Claims 8 and 9 were previously cancelled.

Claims 1-7 and 10-21 are currently pending.

B. 35 U.S.C. §103(a) Rejections

1. Claims 1-7 and 10-15 are rejected as allegedly unpatentable under 35 U.S.C. §103(a) over European Patent No. EP 1,068,901 to *Deguchi* (hereinafter "*Deguchi*") in view of U.S. Patent No. 6,482,304 to *Emery* (hereinafter "*Emery*") for the reasons record.

According to the Office Action, having a mailing date of June 29, 2006, *Deguchi* discloses an electrodeionization device providing a first and second flow path comprising a plurality of alternating depletion and concentration compartments each compartment having a plurality of ion concentration channels capable of allowing the migration of ions into the fluid passing therethrough when a current is generated between said anode and cathode assemblies. The Office Action contends that each depletion compartment is configured such that fluid brought there into flows into each ion concentration channel substantially sequentially. However, the Office Action admits that *Deguchi* fails to disclose the use of conduits to connect deionization channels, but continues to allege that *Emery* teaches the routine use of conduits to connect deionization channels in an electrodeionization unit (see figure 1). Consequently, the invention as whole is alleged to have been obvious to one having ordinary skill in the art at the time the invention was made to modify *Deguchi* with the teachings in *Emery*, because *Emery* teaches that the use of conduits to feed the material being treated through sequential deionizing channels. (see the Office Action, having a mailing date of January 4, 2007, at page 3) Applicants respectfully traverse the rejection.

The Patent and Trademark Office (PTO) bears the burden of initially establishing a *prima facie* case of obviousness. MPEP §2142. The standard required to establish a *prima facie* case of obviousness is as follows: "First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine what the reference teaches. Second, there must be a

reasonable expectation of success. (emphasis added) Finally, the prior art reference (or references combined) must teach or suggest all the claim limitations.” The Supreme Court has recently instructed that the analysis of an obviousness finding must be made explicitly part of the record. *KSR International Co. v. Teleflex Inc.* (2007) (Slip Op. at page 4). Additionally, the Supreme Court acknowledged the importance of identifying “a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does” in an obviousness determination. *KSR International Co. v. Teleflex Inc. et al.* (127 S. Ct. 1727, 1731 (2007) Furthermore, “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” (emphasis added) (*In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006) cited with approval in KSR)

Deguchi teaches an electrodeionization apparatus comprising an anode (9); a cathode (2); cation-exchange membranes (4) and anion-exchange membranes (6) alternately arranged between the anode and the cathode; longitudinal desalting compartments and concentrating compartments being alternately formed between the cation-exchange membranes and the anion-exchange membranes, cells (22) formed in each of the desalting compartments, said cells being defined by a partition member (21), the cation-exchange membrane and the anion-exchange membrane; and ion exchanger filled in each cell, characterized in that: the partition member comprises inclined portions inclined obliquely relative to the longitudinal direction of the desalting compartment, and wherein the inclined portions of the partition member are impermeable to the ion exchanger but are permeable to water so as to allow water to flow between cells obliquely relative to the longitudinal direction of the desalting compartment. (paras [0014] to [0020], [0026], [0037], and [0038]; Figures 1 and 12)

Deguchi additionally teaches in para [0027]:

[T]hough only one channel 26a is illustrated to communicate with only the left top cell in Fig. 1, that a plurality of channels 26a are formed in the upper portion of the frame 20 to uniformly distribute the raw water into the respective top cells aligned in the lateral direction, that is, the channels 26a directly communicate with the respective top cells. In the same manner, though only one channel 28a is illustrated to communicate with only the right bottom cell in Fig. 1, actually a plurality of

channels 28a are formed in the lower portion of the frame 20 so as to directly communicate with the respective bottom cells.

Deguchi also teaches in para [0038]:

[T]he general direction of water in the desalting compartment is a downward vertical direction because the channels 26a for introducing raw water exist at the top of the frame 20 and the channels 28a for taking out the desalted water exist at the bottom of the frame 20. The partition 21 is inclined relative to the general direction of water exist at upper portions and lower portions of the respective cells, so that the water flows obliquely and downwardly from one cell 22 into the lower left cell 22 and the lower right cell 22. Therefore, the water flows substantially uniformly to all cells 22, thereby improving the contact efficiency between the water and the ion exchanger.

Emery teaches an apparatus and method of recirculating electrodeionization, wherein the electrodeionization apparatus comprising a first deionizing flow path (12, 22) and an integral second deionizing flow path (8, 24). (see Figures 1 and 2) The outflow (40) from the first path is held in a holding tank (4) prior to passage through the second flow path, and the outflow (44) from the second path is available for use. Recirculation of the already purified water in the holding tank maintains the water in the holding tank at a higher standard than otherwise “standing” purified water. Moreover, the ion exchange materials in the first deionizing flow path can be regenerated when water is not flowing through them such that they have a greater capacity for deionization when required. (col. 3, line 61 to col. 4, line 58; Abstract)

Applicants continue to assert that there is no reasonable expectation of success in combining *Deguchi* and *Emery* as alleged in the Office Action, because each, as discussed *supra*, address the electrodeionization of water with distinctly different devices, and nothing in either reference suggests the suitability of making the modification as alleged in the Office Action. Applicants continue to contend that the conduits or first deionizing flow paths (12, 22) and second deionizing flow paths (8, 24) taught in *Emery* would not be successful if used in conjunction with the deionization cells of *Deguchi* because *Deguchi* teaches that the lateral flow of water is needed to improve contact efficiency. *Deguchi* states at para [0014]:

The electrodeionization apparatus of the present invention has desalting compartments, each of which is divided into a plurality of cells by a partition member, and an ion exchanger is filled in the respective cells. At least a part of the partition member facing the cell is inclined relative to a normal flow direction of the water in the desalting compartment.... Therefore at least a part of the water flowing into the desalting compartment should flow obliquely relative to the normal flow direction of water so that the water is dispersed overall the desalting compartment.

If conduits were provided at the bottom of each of *Deguchi*'s cells (which would always be the case except for the bottom row of cells) as alleged by the Office Action, the lateral flow of the water would be lost, and thus the efficiency as suggested by *Deguchi* in para [0011] would be lost, and the ability of the water to flow substantially uniformly to all the cells would be lost as suggested by *Deguchi* para [0038]. Applicants respectfully submit that modifying the electrodeionizing apparatus taught by *Deguchi* with the conduits or pathways taught by *Emery* as alleged in the Office Action would not be successful, thus the combination of *Deguchi* in view of *Emery* is not *prima facie* obvious.

Applicants respectfully contend that the PTO has not met its burden because neither *Deguchi* nor *Emery* either taken alone, or as combined in the Office Action, teach or suggest all of the claim elements as set forth in independent claims 1 and/or 10. Applicants also contend that there is no teaching, suggestion or proper motivation in any of these references to combine or modify their teachings to arrive at the claimed invention as alleged in the Office Action. Additionally, since claims 2-7 depend on claim 1, and claims 11-15 depend on claim 10, Applicants respectfully contend that the rejection of these claims has been obviated as well.

Accordingly, Applicants respectfully contend that at least for these reasons, the *prima facie* case of obviousness has been rebutted, and respectfully request reconsideration and withdrawal of the rejection.

2. Claims 16-19 are rejected as allegedly unpatentable under 35 U.S.C. §103(a) over *Deguchi* in view of *Emery* as applied to the claims above, further in view of U.S. Patent No. 6,284,124 to *DiMascio et al.* (hereinafter "*DiMascio*"). The Office Action admits, at page 2, that *Deguchi* in view of *Emery* fails to disclose the modification to the size of the particles (resin

beads) as claimed, but alleges that *DiMascio* teaches the modification to the change in size to provide the desired result. (col. 7, lines 9-50) Applicants respectfully traverse.

As discussed *supra*, modifying the electrodeionizing apparatus taught by *Deguchi* with the conduits or pathways taught by *Emery* as alleged in the Office Action would not be successful, thus the combination of *Deguchi* in view of *Emery* is not *prima facie* obvious. Since *DiMascio* fails to cure the deficiencies of modifying the electrodeionizing apparatus taught by *Deguchi* with the conduits or pathways as taught by *Emery* as alleged in the Office Action and as discussed *supra*, Applicants respectfully contend that the combination of *Deguchi* in view of *Emery*, further in view of *DiMascio* is not *prima facie* obvious.

Accordingly, Applicants respectfully contend that at least for these reasons, the *prima facie* case of obviousness has been rebutted, and respectfully request reconsideration and withdrawal of the rejection.

3. Claims 20-21 are rejected as allegedly unpatentable under 35 U.S.C. §103(a) over *Deguchi* in view of *Emery* as applied to the claims above, and further in view of U.S. Pub. No. 2002/0144954 to *Arba et al.* (hereinafter "*Arba*"). The Office Action admits, at page 3, that *Deguchi* fails to disclose the monolithic framework as claimed, with channels and inlets as defined therein, but alleges that *Arba* discloses the use of monolithic frameworks to produce the benefits obtained the use thereof. (see examples 1 and 2 on page 4). Consequently, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the disclosure of *Deguchi* with the teaching of *Arba* because *Arba* discloses the benefits obtained by the use of a monolithic framework in an electrodeionization cell. Applicants respectfully traverse.

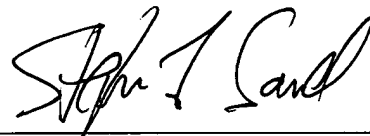
As discussed *supra*, modifying the electrodeionizing apparatus taught by *Deguchi* with the conduits or pathways taught by *Emery* as alleged in the Office Action would not be successful, thus the combination of *Deguchi* in view of *Emery* is not *prima facie* obvious. Since *Arba* fails to cure the deficiencies of modifying the electrodeionizing apparatus taught by *Deguchi* with the conduits or pathways as taught by *Emery* as alleged in the Office Action and as discussed *supra*, Applicants respectfully contend that the combination of *Deguchi* in view of *Emery*, further in view of *Arba* is not *prima facie* obvious.

Accordingly, Applicants respectfully contend that at least for these reasons, the *prima facie* case of obviousness has been rebutted, and respectfully request reconsideration and withdrawal of the rejection.

IV. CONCLUSION Applicants believe that the above response is a complete response to the present Office Action. In view of the foregoing remarks, Applicants respectfully request the reconsideration and withdrawal of the rejections. It is believed that all claims are now in condition for allowance. If however the Examiner believes that some requirement has been missed or not completely answered, or believes that a telephonic interview will advance the prosecution of this application, the Examiner is invited to contact the undersigned at the telephone number provided below

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account.

Respectfully submitted,



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